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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/428,052

10/27/1999

KIYOSHI IRINO

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02/27/2003

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EXAMINER

DIAZ, JOSE R

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 02/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicati n No.

09/428,052

Applicant(s)

IRINO, KIYOSHI

Examiner

José R Díaz

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 6, 10-12, 15 and 16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6, 15 and 16 is/are allowed.
- 6) ☒ Claim(s) 10-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 08/917,936.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

➤ A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 13, 2002 has been entered.

### ***Claim Objections***

➤ Claim 12 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 12 does not further limit claim 10 because the limitation recited in claim 12 was incorporated in the amended claim 10.

### ***Claim Rejections - 35 USC § 102***

➤ The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

➤ Claims 10-12 are rejected under 35 U.S.C. 102(e) as being anticipated by Pan (US Pat. No. 5,750,435).

Regarding claims 10 and 12, Pan teaches a method for manufacturing a semiconductor device (see cols. 1-10) comprising: forming a gate oxide film on a substrate; forming a gate electrode pattern, forming diffusion regions; implanting N atoms after the step of forming the diffusion regions (see col. 6, lines 6-15 and col. 10, lines 5-25), wherein said implantation step is conducted with a dose of, for example,  $1\text{E}14\text{ cm}^{-2}$  (see col. 6, lines 12-14).

Regarding claim 11, Pan teaches energy of, for example, 5 keV (see col. 6, lines 14-15).

#### ***Allowable Subject Matter***

➤ Claims 6 and 15-16 are allowed.

#### ***Response to Arguments***

➤ Applicant's arguments filed December 13, 2002 have been fully considered but they are not persuasive. Applicant argues that the reference Pan does not anticipates the claimed invention since Pan fails to teach the claimed ranges of ion implantation dose and implantation energy. However, the Examiner disagrees. With regards to the dose concentration, Applicant clearly pointed out that the invention is not limited to only a dose concentration of  $1\text{-}3 \times 10^{14}\text{ cm}^{-2}$  (see page 14 lines 8-12 of Applicant's Specification). As a matter of fact, such a claimed dose range is not a critical range, but merely an example provided by Applicant (please note the use of the terms "For example" and "may be" on page 14, lines 8 and 10, respectively). Thus, the

Art Unit: 2815

reference Pan anticipates the claimed limitation since Pan teaches an ion dose of, for example,  $1 \times 10^{14} \text{ cm}^{-2}$  (see col. 6, lines 12-13), which lies within the claimed dose range and achieves the result of incorporating N atoms in the gate oxide, which is the same result disclosed by Applicant. Further, the Federal Circuit has stated that in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Therefore, the references Pan anticipates the claimed limitation since first, the claimed dose range is not a critical range because Applicant fails to show that the claimed range achieves unexpected results relative to the prior art range, and second, Pan teaches an ion dose, which lies within the claimed dose range.

With regards to the implantation energy, Applicant states that what is critical for the invention is the step of setting the acceleration voltage (see page 14, lines 6-8 of Applicant's Specification). For example, Applicant states that by setting the acceleration voltage to 100 KeV or less the N+ atoms do not reach the substrate (see page 14, lines 9 of Applicant's Specification). Pan clearly teaches such a critical step in column 6, lines 13-15, wherein Pan discloses an acceleration voltage of less than 100 KeV. Therefore, the reference Pan anticipates the claimed limitation since Pan teaches the critical step of an acceleration voltage of less than 100 keV. As such the rejection is considered to be proper.


***Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to José R Díaz whose telephone number is (703) 308-6078. The examiner can normally be reached on 9:00-5:00 Monday, Tuesday, Thursday and Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 746-3891 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JRD  
February 24, 2003



**EDDIE LEE**  
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